

Fire Extinguishers



Hand held portables

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Fire Extinguishers

Fire Extinguisher Training Requirements. 29 CFR 1910.157(g)

Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with:

- the general principles of fire extinguisher use and
- the hazards involved with incipient stage fire fighting
- upon initial employment and
- at least annually thereafter.

Additional references: AR 420-90, TB 5-4200-200-10, NFPA 10

Fire Extinguishers

When faced with a fire, you must make some split second decisions:

Do I want to put out this fire?

How do you operate this thing, anyway?

Do I need help?



Fire Extinguishers

Time is critical in any first-aid fire situation....

The employee must be able to make split-second decisions with confidence.

Are the capabilities of this extinguisher sufficient for the size of the fire?

Does the fuel source make the fire too hazardous for this extinguisher?

Is the extinguisher the proper type for this fire?

Is there a safe way to turn off or remove the fuel source?

Do environmental conditions indicate that fighting this type of fire would endanger others or me?



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Fire Extinguishers

When seconds count.....

Even a willing operator cannot successfully extinguish a fire unless they know how to actuate the available equipment.

Fire Extinguishers

Task: Operate common types of first-aid fire extinguishing equipment (portable fire extinguisher)

Condition: Given a common type A, B or C or combination extinguisher

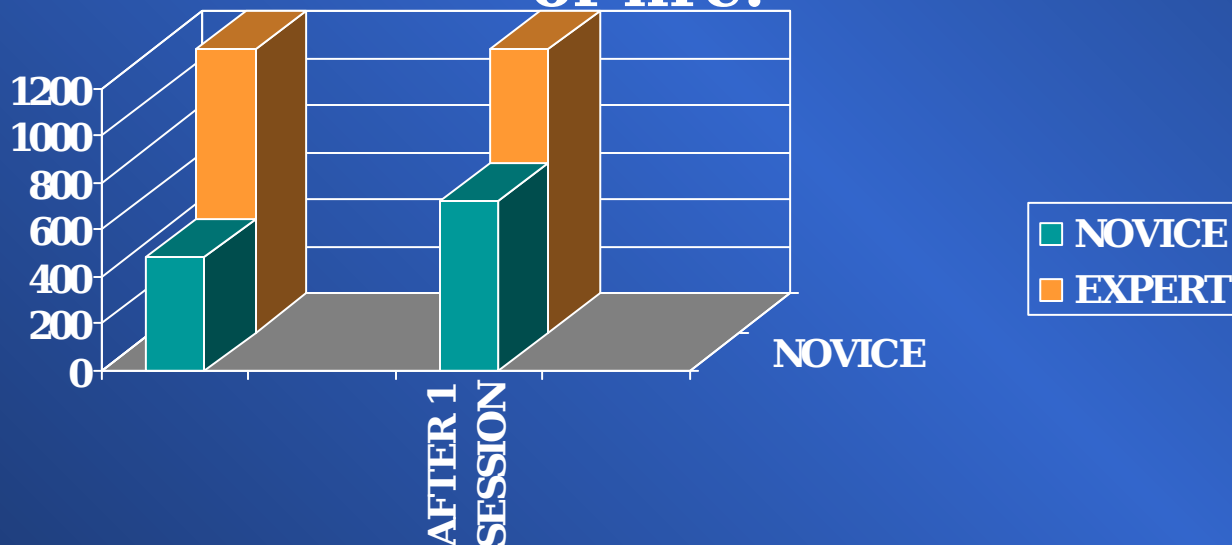
Standard:

- Assess conditions and whether to use the portable extinguisher or evacuate the area
- Determine the fire classification (A, B, C, or D)
- Interpret extinguisher pictographs
- Use P.A.S.S. to extinguish fire

Step by step sequential pictures and drawings should provide you with a useful guide to the activation and operation of this equipment.

Fire Extinguishers

The novice should be able to extinguish 480 square foot of fire, while an expert could put out a 1200 square foot fire with the same extinguisher. After the first training session the novice should be able to put out an additional 50% or 240 additional square feet of fire.



Fire Extinguishers

Hands-on training

- Participants will get the opportunity to use the types of extinguishers found in their workplace on live, controlled fires.
- This is a great way to build confidence!

Fire Extinguishers

After training participants will be:

- Aware of the importance of portable fire extinguishers as a fire fighting tool**
- Familiar with the common types of extinguishers**
- Respectful of the limitations of equipment and operator**
- Knowledgeable of the steps to be taken when a fire is discovered**
- Capable of integrating their new knowledge into other areas of their lives**

Fire Extinguishers

TYPES OF FIRE

There are three common types or classes of fire:

- Class A - Combustible material
- Class B - Flammable liquid
- Class C - Electrical
- Class D - Combustible metals (not as well known)

Fire Extinguishers



CLASS "A":

Class "A" type fires involve ordinary combustibles
such as: wood, paper, cloth, rubber, and many plastics.

Fire Extinguishers



- CLASS "B":

Class "B" type fires involve flammable liquids such as:
gasoline, oil, grease, tar, oil-based paints, lacquer, and flammable gases.

Fire Extinguishers

ELECTRICAL



EQUIPMENT

- CLASS "C":

Class "C" type fires involve energized electrical equipment such as: wiring, fuse boxes, circuit breakers, machinery, and appliances.

Fire Extinguishers

COMBUSTIBLE










METALS

- CLASS "D":

Class "D" type fires involve combustible metals such as magnesium, titanium, sodium, etc.

Fire Extinguisher Labeling

TYPES OF FIRES		
LETTER SYMBOL		PICTURE SYMBOL
	For wood, paper, cloth, trash and other ordinary materials.	
	For gasoline, grease, oil, paint and other flammable liquids.	
	For live electrical equipment.	
	For combustible metals.	No Current Symbol

Letter symbols and picture symbols make it easy to select the proper extinguisher for the type of fire.

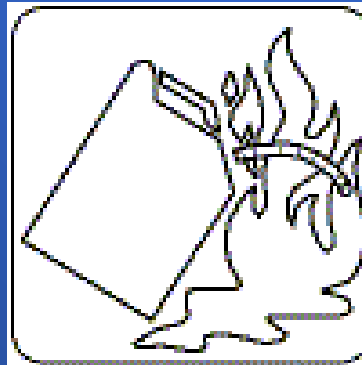
Fire Extinguishers

Newer extinguishers now carry a
Pictograph Labeling System

Extinguisher Symbols for



Class A,



Class B



and Class C

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Fire Extinguishers

Pictograph Labeling

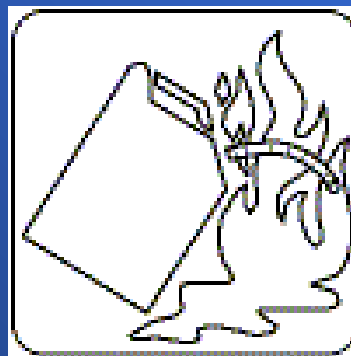
Extinguisher for Class A (B and C are blacked out)



Fire Extinguishers

- Pictograph Labeling

Extinguisher for Class A and B (C is blacked out)



Fire Extinguishers

Pictograph Labeling

Extinguisher for Class B and C (A is blacked out)



Fire Extinguishers

Extinguisher types

The fire equipment manufacturers refer to three basic types of hand portable fire extinguishers:

1. Stored pressure
2. Cartridge operated
3. Sealed pressure

Fire Extinguishers

The difference lies mainly in the sealing method and the means by which the container is pressurized



Fire Extinguishers

Classified as either stored pressure or cartridge operated, they are additionally classified by Underwriters Laboratory (UL) as:

- ABC - (Ammonium Phosphate).
- BC - (Sodium Bicarbonate; Purple K).
or
- D - (Super D or Sodium Chloride),
Copper, or G-Plus
(Graphite).

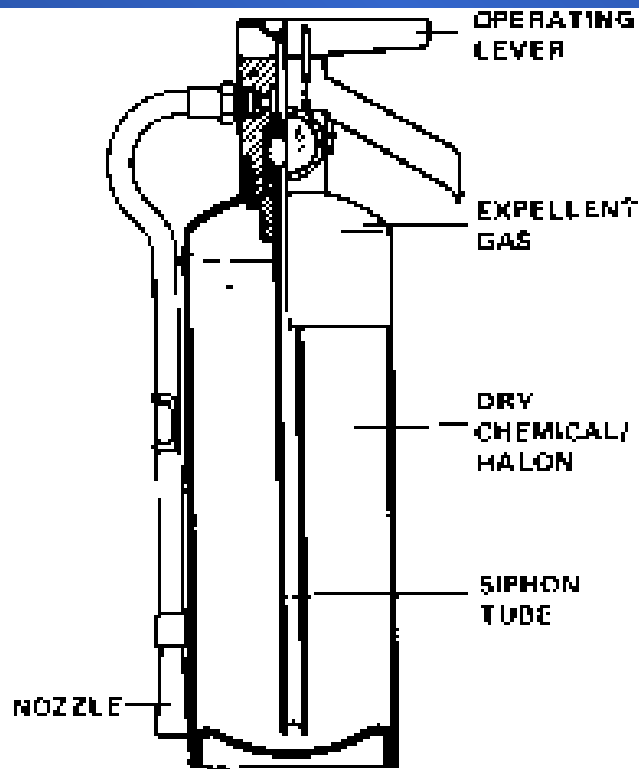
Fire Extinguishers



- **Stored pressure**

In stored pressure models the expellent gas and extinguishing agent are stored in a single chamber and discharge is directly controlled by the valve

Fire Extinguishers



- **Stored pressure**

These units have the advantage of being easily inspected since most are equipped with a pressure gauge indicating that the unit is ready for use.

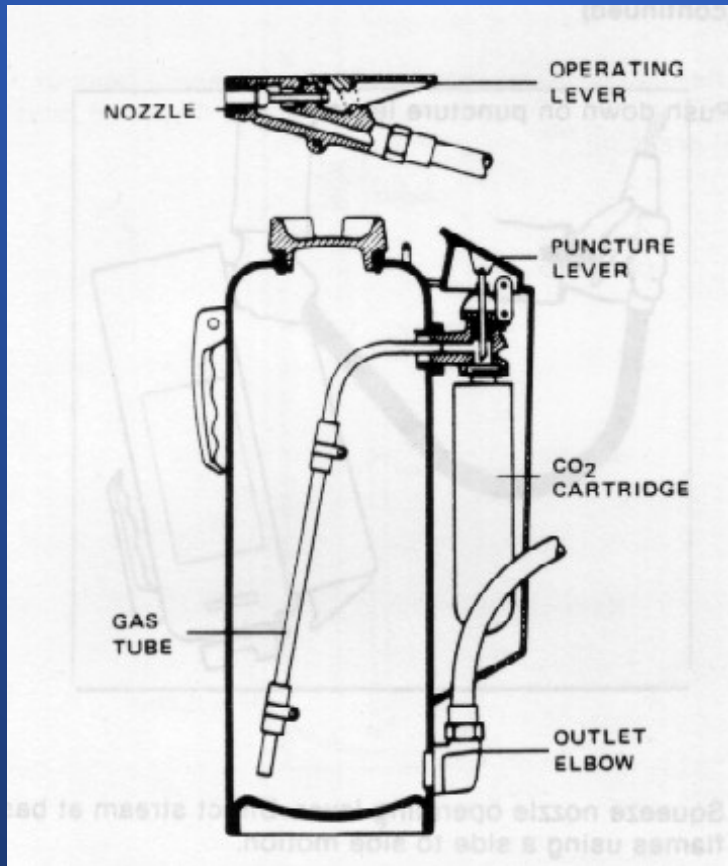
Fire Extinguishers



- **Stored pressure**

Once used this unit requires special recharging equipment and is normally returned to the fire department for recharge

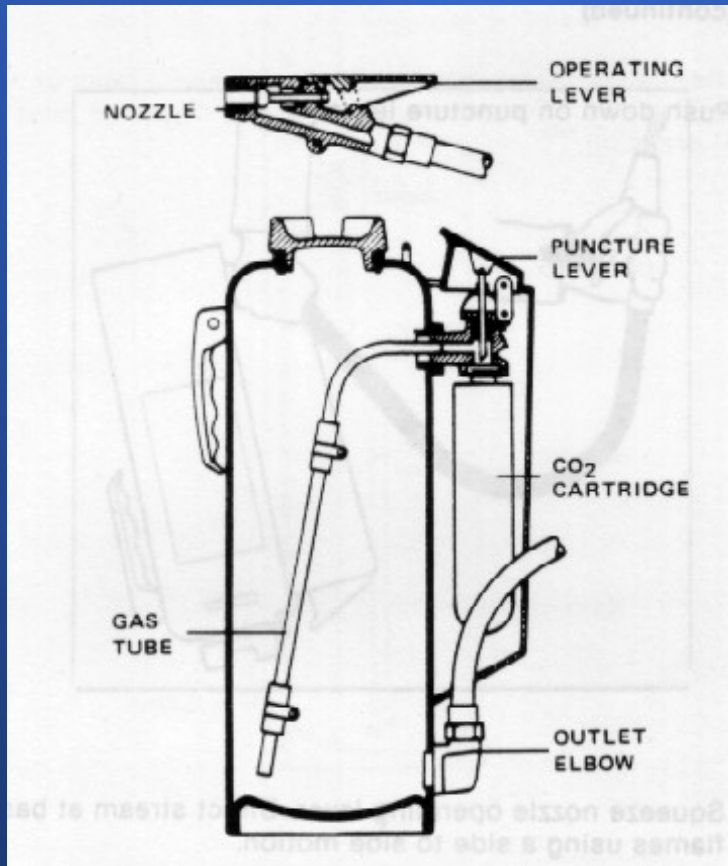
Fire Extinguishers



- **Cartridge operated**

With cartridge operated fire extinguishers, the expellent gas is stored in a separate cartridge located within or adjacent to the shell containing the extinguishing agent

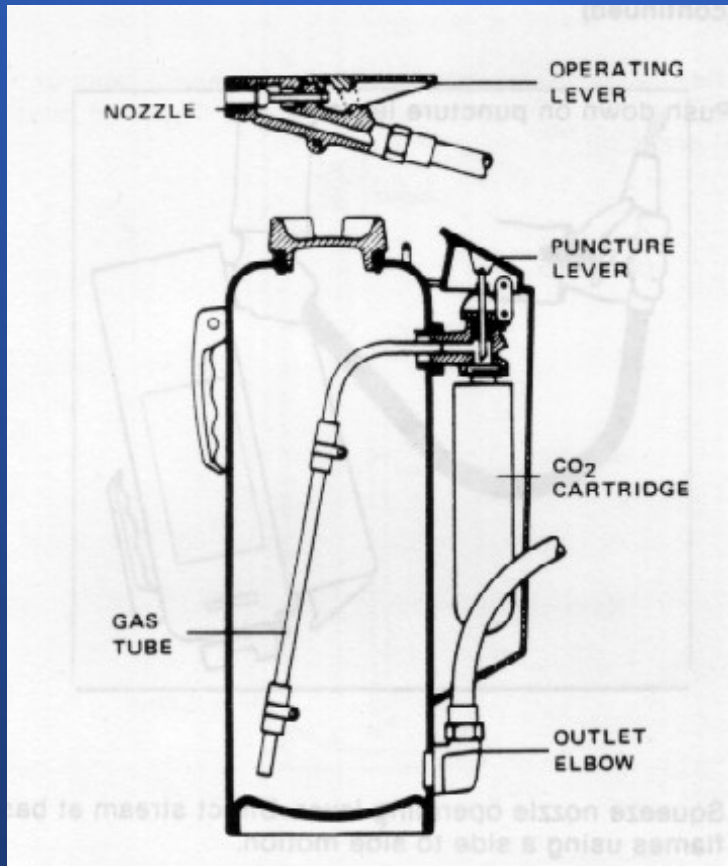
Fire Extinguishers



- **Cartridge operated - cont.**

The extinguishers are actuated by releasing the expellent gas which in turn expels the extinguishing agent. The discharge is then controlled by a valve which is generally located at the end of a discharge hose

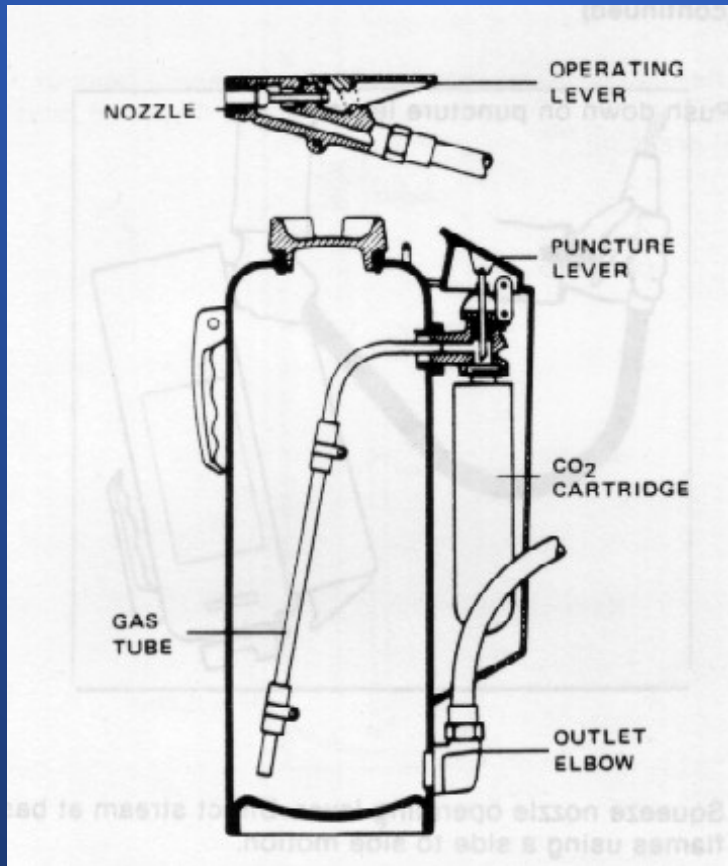
Fire Extinguishers



- **Cartridge operated - cont**

Since these units are not under expellent gas pressure until actuated, a pressure gauge is of little use and inspection must be accomplished by weighing the gas cartridge and checking the condition of the dry chemical agent

Fire Extinguishers



Cartridge operated - cont

Once used, however,
recharge is
accomplished by simply
refilling
the container with
extinguishing
agent and replacing the gas
cartridge.

Fire Extinguishers



Sealed pressure

Sealed pressure fire extinguishers are much the same as stored pressure units and are often referred to as disposable-non refillable types

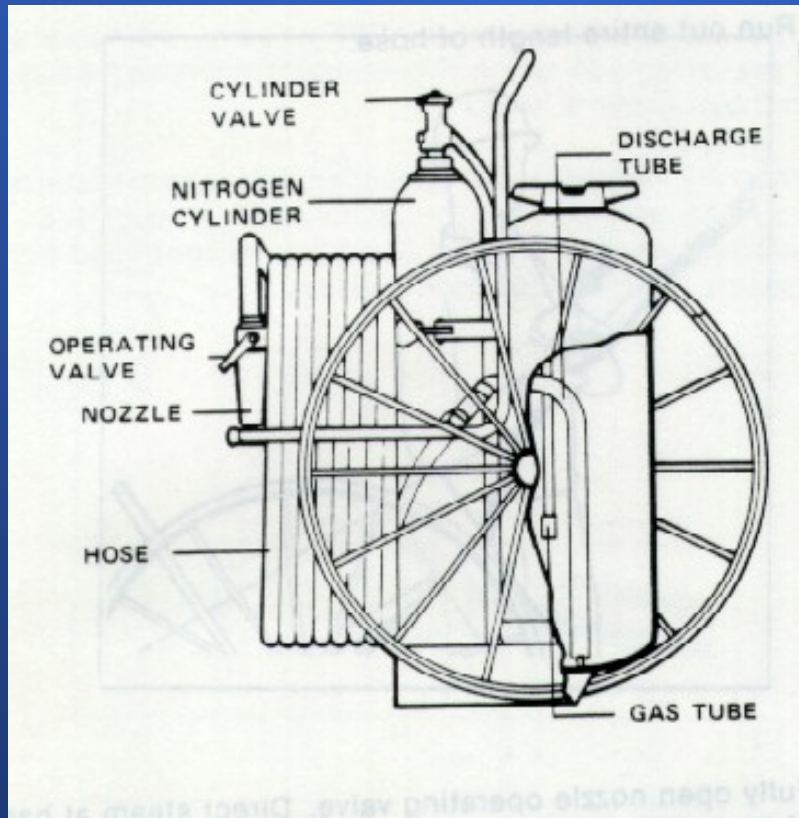
Fire Extinguishers



Sealed pressure - cont.

**The expellent gas and
extinguishing agent are both
stored in a single chamber,
but differ from stored
pressure units in that
sealing
is accomplished by means of
a frangible metal disc as
opposed to a valve**

Fire Extinguishers



Wheeled Units

Wheeled units are also considered portable extinguishers and are nitrogen cylinder operated dry chemical units. They are available in sizes ranging from 75 pounds to 350 pounds. They can be used on Class A, B and C fires depending on the agent used.

Fire Extinguishers

Maintenance

The best piece of equipment will not operate if it is not recharged and maintained properly. History has proven that nearly every fire extinguisher failure can be traced back to human negligence.

Fire Extinguishers

Portable fire extinguishers must be visually inspected monthly. The inspection should assure that:

- 1. Fire extinguishers are in their assigned place;**
- 2. Fire extinguishers are not blocked or hidden;**
- 3. Fire extinguishers are mounted in accordance with NFPA Standard No. 10 (Portable Fire Extinguisher);**
- 4. Pressure gauges show adequate pressure (CO2 extinguisher must be weighted to determine if leakage has occurred);**
- 5. Pin and seals are in place;**
- 6. Fire extinguishers show no visual sign of damage or abuse;**
- 7. Nozzles are free of blockage.**

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Fire Extinguishers

Cartridge Operated Maintenance:

Maintenance of a cartridge operated extinguisher means a complete examination, and involves disassembly and inspection of each part and replacement where necessary. Maintenance should be done at least annually or more often if conditions warrant.

Check with local fire prevention for specific installation maintenance, inspection and turn-in procedures.

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Fire Extinguishers

Wheeled Units Maintenance:

Maintenance of wheeled units consists of monthly checks of the nitrogen pressure, at 70 degrees Fahrenheit the cylinders

should register 2150 psi. The hose should be checked as well as the operation of the nozzle checking inside the nozzle for insect nests, the wheels should be turned monthly to insure that they are freewheeling.

Check with local fire prevention for specific installation maintenance, inspection and turn-in procedures.

Fire Extinguishers

Extinguisher Placement (Travel Distance)

The following chart contains OSHA requirements for classes of fires and travel distance to an extinguisher.

Some local requirements may be stricter, so you should always check with your local fire marshal / fire prevention office.

• Fire Class	Travel Distance
• Class A	*75 ft. (22.9m) or less
• Class B	50 ft. (15.2m)
• Class C	Based on appropriate A or B Hazard
Class.	
• Class D	75 ft

Fire Extinguishers

Hydrostatic Test Intervals Portable Fire Extinguishers

Stored Pressure Water, Loaded Stream, Anti Freeze.....5 yrs

Wetting Agent.....5 yrs

AFFF (Aqueous Film Forming Foam.....5 yrs

FFFP (Film Forming Fluoroprotein Foam.....5 yrs

Carbon Dioxide.....5 yrs

Dry Chemical with Stainless Steel Shells.....5 yrs

Dry Chemical, Stored Press. (Mild Steel/Aluminum).....12 yrs

Dry Chemical, Cartridge Operated.....

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Fire Extinguishers

Safety Tips: Portable Fire Extinguishers

This is a brief overview of the important points of using a portable fire extinguisher. Fire can be devastating, but when used properly, a fire extinguisher can save lives and property.

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Fire Extinguishers

USING A FIRE EXTINGUISHER

The P.A.S.S. word is a method for operating most common fire extinguishers. It is a four step method.

Fire Extinguishers

Utilize the P.A.S.S method.

{P} Pull, remove the pull pin.

{A} Aim, point the nozzle at the base of the fire.

{S} Squeeze, depress the lever to start the discharging of the chemical.

{S} Sweep, move the extinguisher with a sweeping motion at the base of the fire until the fire is out.

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Fire Extinguishers

Pass Method

"P" stands for PULL the pin.

This will unlock the operating handle and allow you to discharge the extinguisher.

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Fire Extinguishers

Pass Method

"A" stands for AIM

at the base of the fire.

Fire Extinguishers

Pass Method

"S" stands for SQUEEZE

the operating handle. This will discharge the fire fighting agent.

Fire Extinguishers

Pass Method

"S" stands for SWEEP

from side to side. Move carefully in on the fire, aiming at the base, sweep back and forth.

Fire Extinguishers

Actual hands on training with the equipment you have available at your locations is the only way to learn both your and the extinguishers capabilities.

Fire Extinguishers

Remember.....

The average hand portable extinguisher will only operate for 30 seconds ----- There is NO TIME to learn during an actual emergency.

Fire Extinguishers

IN CASE OF FIRE

- Evacuate the building
- Call the fire department
- Make sure the fire is small
- Make sure you have a clear way out

Fire Extinguishers

IN CASE OF FIRE

- **Make sure the fire extinguisher is rated for the type of fire and that you know how to use the extinguisher.**
- **Start as far away from the fire as possible**
- **Always back away from the fire even if it appears to be out.**

Fire Extinguishers

- It is reckless to fight the fire if

ALL of these conditions do not exist.

- Instead leave the building closing the doors behind you to slow the spreading of the fire and smoke.

Fire Extinguishers



Hand held portables

Thanks for the great work developing this presentation

by

Nancy Lamberson

Safety professional, Graduate student 1998.